

WASHINGTON STATE DEPARTMENT OF ECOLOGY

WATER QUALITY PROGRAM

Amy Jankowiak, Compliance Specialist

(425) 649-7195

ajan461@ecy.wa.gov



- Ecology Website: <http://www.ecy.wa.gov/ecyhome.html>
- Cruise Ship Website:
http://www.ecy.wa.gov/programs/wq/wastewater/cruise_mou/index.html

Department of Ecology & the Water Quality Program

OUR ROLE / MISSION

To protect, preserve and enhance Washington's environment, and promote the wise management of our air, land and water

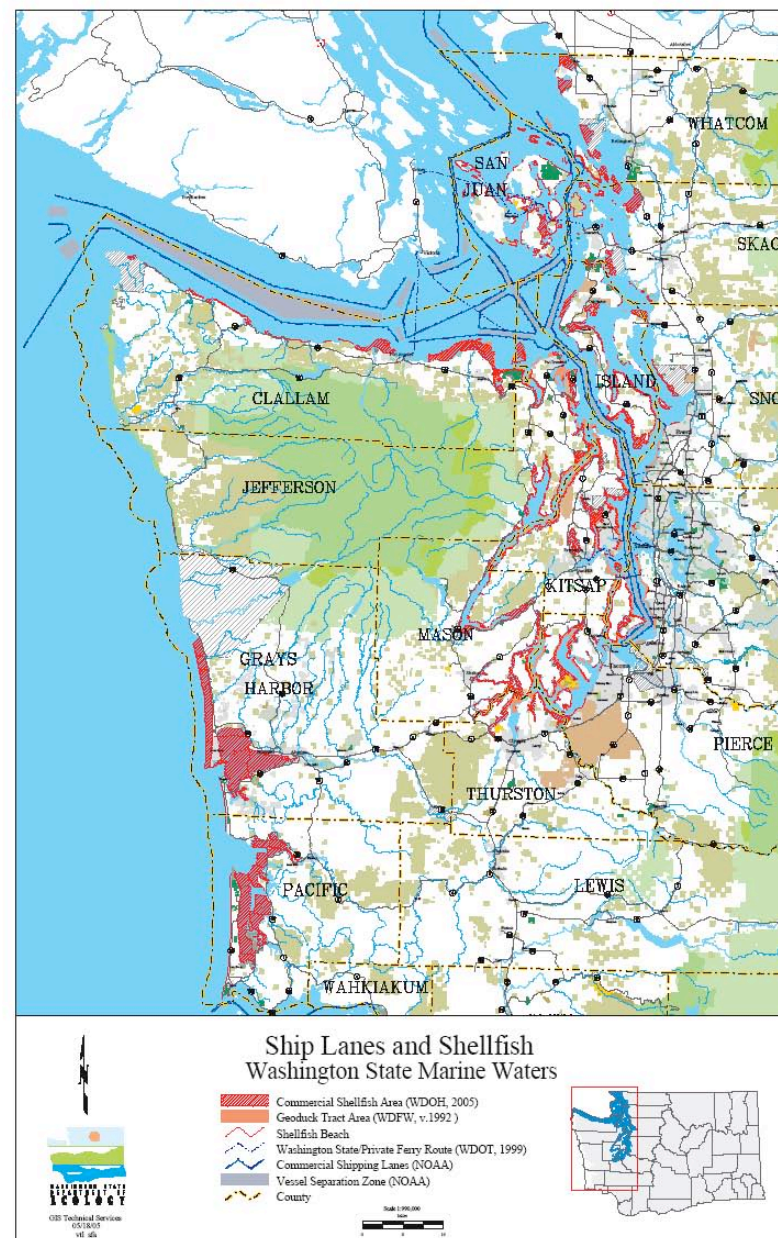
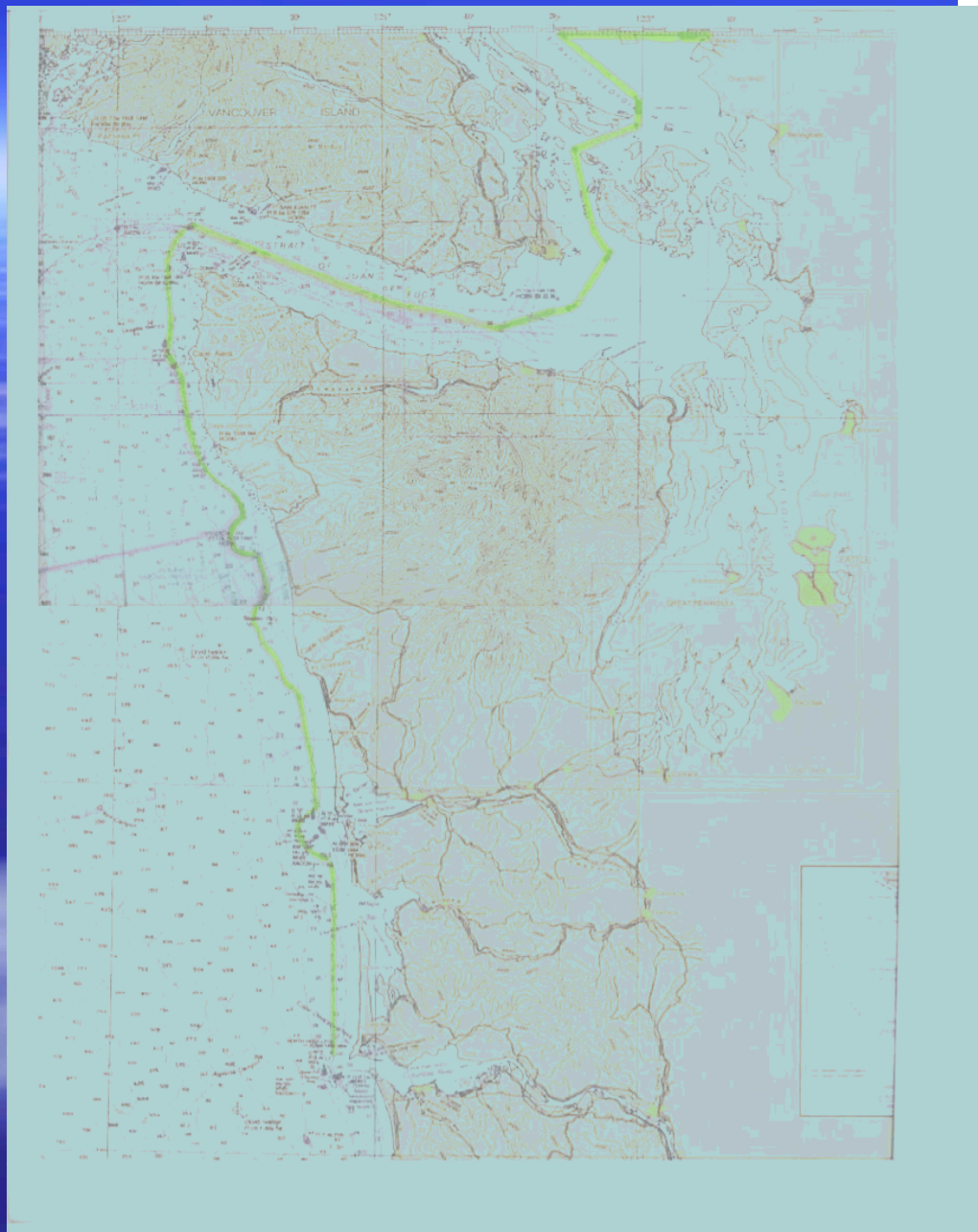
To protect and restore Washington's waters

GOALS:

- Prevent pollution
- Clean pollution
- Support sustainable communities & natural resources
- Focus on cleaning up Puget Sound

Why Focus on Cruise Ships

- Protect State waters
- Cruise ships are similar to small cities
 - We have a number of permitted wastewater treatment plants on land smaller than the average cruiseship discharge volume
 - Moving outfall
 - Various waste streams
 - Operating a treatment system – part art, part science; upsets/problems occur
- Unique shape of State/marine waters
 - Ships can be greater than 3nm from shore and still in WA waters
 - The Puget Sound is the second largest estuary in the U.S.
 - Poor flushing
- Shellfish protection – public health
 - Over 1000 miles of Approved and Prohibited Area shellfish shoreline
- Regulation



How sewage can harm water

- Oxygen depletion (organics – Biochemical Oxygen Demand)
- Toxicity (ammonia, chemicals...) – fish kills, affects reproduction, human consumption
- Algae - Nitrogen and other nutrients (oxygen depleting and aesthetics)
- Human Health effects - Fecal coliform , viruses (shellfish...)

CRUISE SHIP DISCHARGES

MEMORANDUM OF UNDERSTANDING WASHINGTON STATE



The MOU

- SHIPS COVERED:

- NWCA member lines (all > 1day, all >250 passengers, 15 ships in 2007)

- SHIPS NOT COVERED:

- Non NWCA large cruise ships that come to WA (2 IN 2007)
- Small cruise ships (<250)
- AK Marine Hwy System (out of Bellingham)
- WA State Ferries (to land)
- Other types of ships or boats

The MOU

- Signed April 20, 2004
One day before start of cruise season
 - Major components
 - Defines “Waters subject to the MOU”
 - Prohibits untreated blackwater and untreated graywater discharges
 - Prohibits treated blackwater and treated graywater discharges unless AWTs. Can be approved 2 different ways:
 - One nm away from berth and moving at six knots
 - AWTs which meets Alaska certification standards
 - Documentation prior to discharge
- OR
- Continuously
 - AWTs which meets Alaska certification standards
 - continuous TSS/turbidity monitoring with immediate shut down, and UV just prior to discharge
 - Documentation prior to discharge

The MOU (cont.)

- Allows discharge within one nautical mile if:
 - AWTs Approved in Alaska
 - Documentation submitted prior to discharge
 - 24-hr continuous turbidity or equivalent monitoring
 - Automatic shut down
 - UV disinfection immediately prior to discharge
 - Vessel specific plan

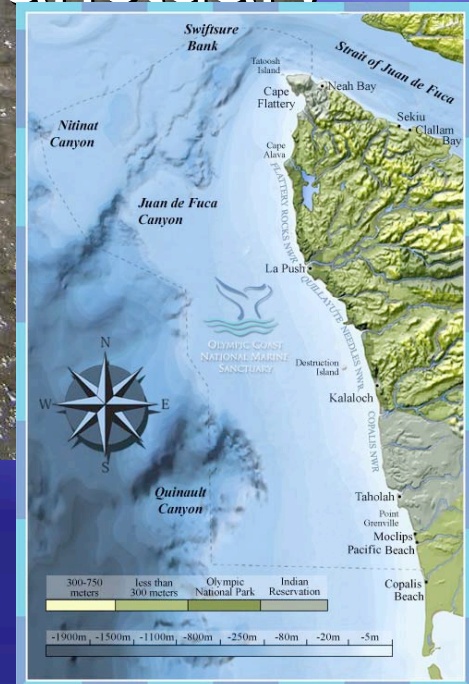
The MOU cont.

Sampling, etc.

- If approved for discharge, agree to:
 - Sample 1/month in Seattle (BOD, TSS, fecal coliform, pH, residual chlorine)
 - Meet limits (fecal GEM 20, BOD/TSS 30/45, pH 6-9, chlorine residual 10ug/l)
 - Split samples with Ecology upon request
 - WET testing once/2years
 - Provide test results (Alaska and Seattle)
 - Vessel inspections by Ecology

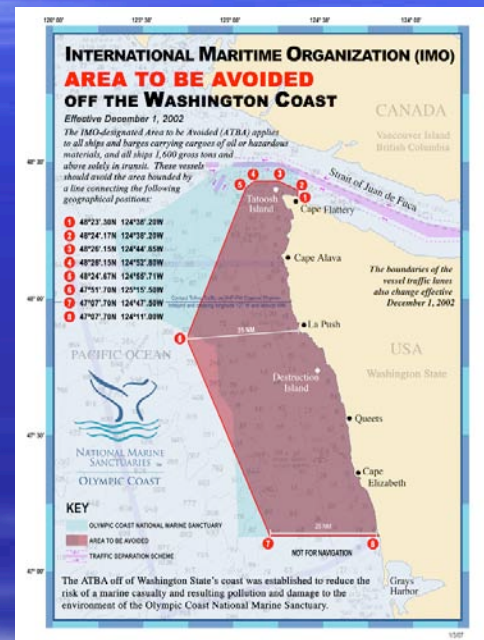
The MOU cont. Sludge

Sludge (residual solids) discharges prohibited in waters subject to MOU, within 12 nautical miles from shore, and within the Olympic Coast National Marine Sanctuary

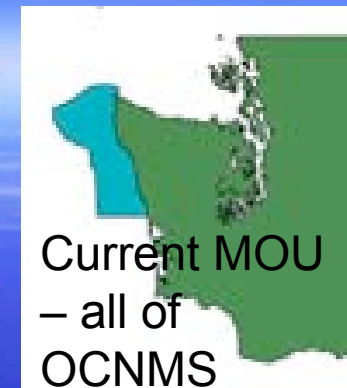




Waters subject to the MOU/Washington waters



Old versions of MOU – ATBA only



The MOU cont.

Other

- Solid waste, discharge prohibited
- Hazardous waste management
- Oily Bilge water
- USCG jurisdiction
- Non-compliance notification, compliance letter
- Annual meeting, Annual Report, Amendments, Funding

Advanced Wastewater Treatment Systems

- Typically = Secondary treatment plus ultrafiltration followed by UV disinfection
(Integrated systems of enhanced aerobic digestion and low-pressure membrane filtration, followed by UV disinfection)
 - Zenon – membrane bioreactor with ultrafiltration
 - Rochem – reverse osmosis
 - Scanship – biological-biofilm with polishing microfiltration
 - Hamworthy – membrane bioreactor with ultrafiltration
- High quality effluent

Comparison of Advanced Treatment System Medians

	pH	BOD5	TSS	Total Residual Chlorine	Fecal Coliform
Units	Standard units	mg/L	mg/L	mg/L	MPN/100 ml
Rochem	7.28	14.9	0	0	0
Zenon	7.64	0	0	0	0
Scanship	6.94	10.9	7	0	0
Hamworthy	7.33	2.2	0	0	0

Source: ADEC Large Passenger Vessel Wastewater Discharge General Permit Information Sheet



AWTS sampling



ultrafilter



UV disinfection



Food Waste



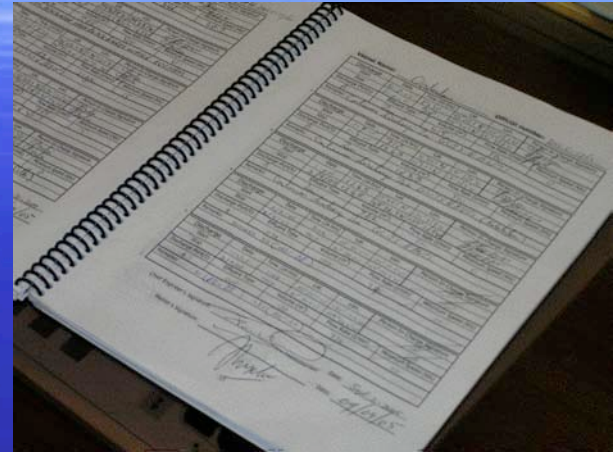
Oily Bilge

MOU Amendments

- Amendments – July 2005, May 2006, May 2007
 - Clarification changes
 - Now covers other ports in WA
 - Added requirement for annual compliance report
 - Specifies limits set for monitoring results
 - Expands sludge discharge prohibition to entire OCNMS

COMPLIANCE EVALUATION

- Sampling Data
 - Sampling done per MOU, submitted, meets requirements
- Inspections
 - Allowed a minimum of once/season to verify compliance with MOU
- Other Provisions
- Compliance/Non-Compliance Notifications
- Annual Compliance Reports



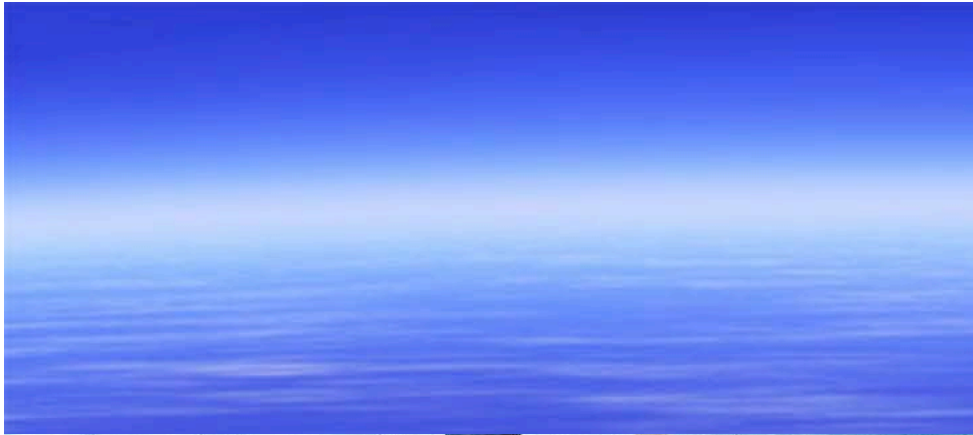
Inspections

- Typical Inspection includes
 - Introductions/overview of plan for the day (prior notification given)
 - Control room
 - Run-through of how system works
 - Variety of questions on staffing, training, protocols...
 - Review of records
 - Tour of treatment system(s)
 - Observations of other waste streams on the ship
 - Sampling
 - Conclude
- Approximately 2 hours in length
- Similar to inspections for on-land plants

Inspections

Inspection findings

- In general, the ship's wastewater systems have been operating well with high quality effluent
- Some violations/concerns discovered:
 - Copy of MOU unavailable, notification procedures unknown, disinfection system maintenance...
 - Unauthorized discharges untreated gw and partial treated bw; MERCURY; \$100,000 fine



The MOU Overall

■ Benefits

- Without regulation specific to cruise ships, at least have agreement in place to protect water quality
- Still have enforcement capabilities under WQ Standards and RCW 90.48.080 as well as press coverage if violate MOU
- Learning more about the vessels and equipment
- Gathering sampling data
- Open communication with lines and vessels
- Procedure for notification of noncompliance

■ Issues

- Inability to enforce on the agreement itself
- Lack of coverage of MOU for smaller passenger vessels or vessels that are not part of the Association
- Air quality issues not currently covered by the MOU



THE END!
QUESTIONS?